



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/SE94/00275</p> <p>(22) International Filing Date: 28 March 1994 (28.03.94)</p> <p>(30) Priority Data: 9301047-8 30 March 1993 (30.03.93) SE</p> <p>(71) Applicant (for all designated States except US): VÄSTSALLAT AB [SE/SE]; S-440 80 Ellös (SE).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): HOLMSTRÖM, Anders [SE/SE]; Lärkträdsvägen 30, S-440 90 Henån (SE). LINDQVIST, Lars [SE/SE]; Stötekärsvägen 9 B, S-421 77 V Frölunda (SE).</p> <p>(74) Agent: AWAPATENT AB; P.O. Box 11394, S-404 28 Göteborg (SE).</p>		<p>(81) Designated States: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. In English translation (filed in Swedish).</p>
<p>(54) Title: CULTIVATION SUBSTRATE</p> <div> </div> <p>(57) Abstract</p> <p>A substrate (1) for cultivation of plants, vegetables and the like (2) is composed of a fibrous pulp material in the form of fluff (3) and of a wrapping (4) enclosing said fluff. The upper face of said wrapping is slit to produce cuts (8) in which the plants, vegetables and the like (2) may be inserted.</p>		

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CULTIVATION SUBSTRATE

The subject invention concerns a substrate for cultivation of plants, vegetables and the like, such as tomatoes, cucumbers and paprika but also roses, carnations and other flowers to be used as cut flowers.

Cultivators of plants, vegetables and the like as outlined above today often use, as the cultivation substrate, strips or mats of rock or glass fibre wool, that is, of mineral wool. These strips or mats are comparatively narrow, having a width of say 7.5 cm. The supply of water and plant nutrient solutions therefore may be performed by drip-feeding, generally with the aid of one thin hose for each plant.

This type of mineral wool consists of rather short but above all sharp (fragile) fibres that are more or less densely compacted.

One consequence thereof is that large amounts of the fibres separate and when the mats are manipulated in connection with the deposition thereof and removal from the support prior to the start of the cultivation and at the end thereof, these separated fibres become freely suspended in the air and thus constitute a considerable hazard to the health of the personnel, in addition to which their presence is unsatisfactory from an environmental point of view.

Not being biodegradable, mineral wool, once the cultivation is completed, therefore must be pulled out and be transported to a deposition plant for destruction, with consequential problems and costs.

The main purpose of the subject invention is to suggest a cultivation substrate exhibiting none of the disadvantages outlined above and being non-harmful to the consumers as well as the environment.

This purpose is achieved in that the substrate in accordance with the invention to an essential extent contains a fibrous pulp material which preferably

essentially consists of fluff and which preferably is packaged in an enclosing wrapping.

The invention will be described in closer detail in the following with reference to the accompanying drawing figure which very schematically and in a perspective view illustrates an at present particularly preferred embodiment of the invention.

The substrate in accordance with the invention, designated generally by numeral 1 in the drawing, is intended for cultivation of plants and vegetables 2 and the like, such as tomatoes, cucumbers and paprika, and essentially consists of a fibrous pulp material 3 which preferably is based on paper pulp, i.e. cellulose fibres.

Following a number of tests applicants have found that the fibrous pulp material fluff, that is a material consisting of unbonded pulp fibres and fibre flocs, meets the requirements. The fluff 3 presently regarded to be the most suitable should be un-refined, that is, be withdrawn prior to the refining, and be freed of such substances as nitro-ammonium compounds, sodium and sulphur, for instance by means of washing.

After such treatment, the fluff 3 is dried and it is preferably packaged in an enclosing wrapping 4, the latter, together with the fluff therein, thereafter being flattened to give it essentially flat upper and lower faces 5, 6.

In accordance with the embodiment illustrated the wrapping 4 is formed from a suitable re-usable and/or biodegradable synthetic resin, but obviously it could be made from some other material that suits the required purpose, such as wet-strength paper or the like.

The substrate 1 composed of fluff 3 and the wrapping 4, preferably is configured as illustrated in the drawing figure, as a mat or a strip of optional length, and a thickness and a width of say respectively 3 and 15 cm. Naturally, these dimensions could be varied optionally according to wish.

To facilitate deposition of the substrate 1 on a support, not illustrated, such as the ground inside or outside a greenhouse prior to the start of the cultivation, and also removal/pulling out of the substrate 1 at the end of the cultivation period, the substrate 1 preferably is respectively rolled into or coilable into an easily manageable roll 7. The substrate 1 of strip or mat configuration could also be used in connection with recirculative nutrient systems according to which the substrate, after having been removed/pulled out, is transferred to a collection channel or the like for collection of the nutrients in the substrate.

The upper face 5 of the wrapping 4 may be cut by means of a conventional knife or similar cutting tool in order to make cuts 8 in the substrate 1, deposited at the place of cultivation, in which cuts plants 2 may be inserted in such a way that the root system 9 of the plants 2 is ensured satisfactory and growth-promoting contact with the fluff 3.

Supply of water and nutrients then may be effected in a conventional, optional manner, and a depot supply of fertilizers according to choice in solid or liquid form may be admixed into the fluff 3.

For drainage purposes the lower face 5 of the substrate cover 4 could of course be perforated or otherwise be made water-permeable.

At the end of the cultivation period, the watering is interrupted a few days before the substrate is to be pulled out, to allow the plants 2 to absorb the moisture contained in the substrate 1. After harvesting of the plants 2, the dry substrate 1 together with any remaining vegetable matter also now dried-out, is rolled into a roll 7 to be transported to a depot to be used either as soil-improving material or to be incinerated.

The invention should not be regarded as limited to the embodiments thereof described in the foregoing and illustrated in the accompanying drawings but could be

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modified in a variety of ways within the scope of the  
claimed protection.

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CLAIMS

1. A substrate for cultivation of plants, vegetables and the like, characterized in that to an essential extent it contains a fibrous pulp material (3).

5 2. A substrate as claimed in claim 1, characterized in that the fibrous pulp material (3) is packaged inside an enclosing wrapping (4).

3. A substrate as claimed in claim 1 or 2, characterized in that the wrapping (4) with  
10 the fibrous pulp material (3) contained therein is flattened to give it essentially flat upper and lower faces (5, 6) and in that it is rolled into a roll (7) which may be unrolled onto a support to form a mat.

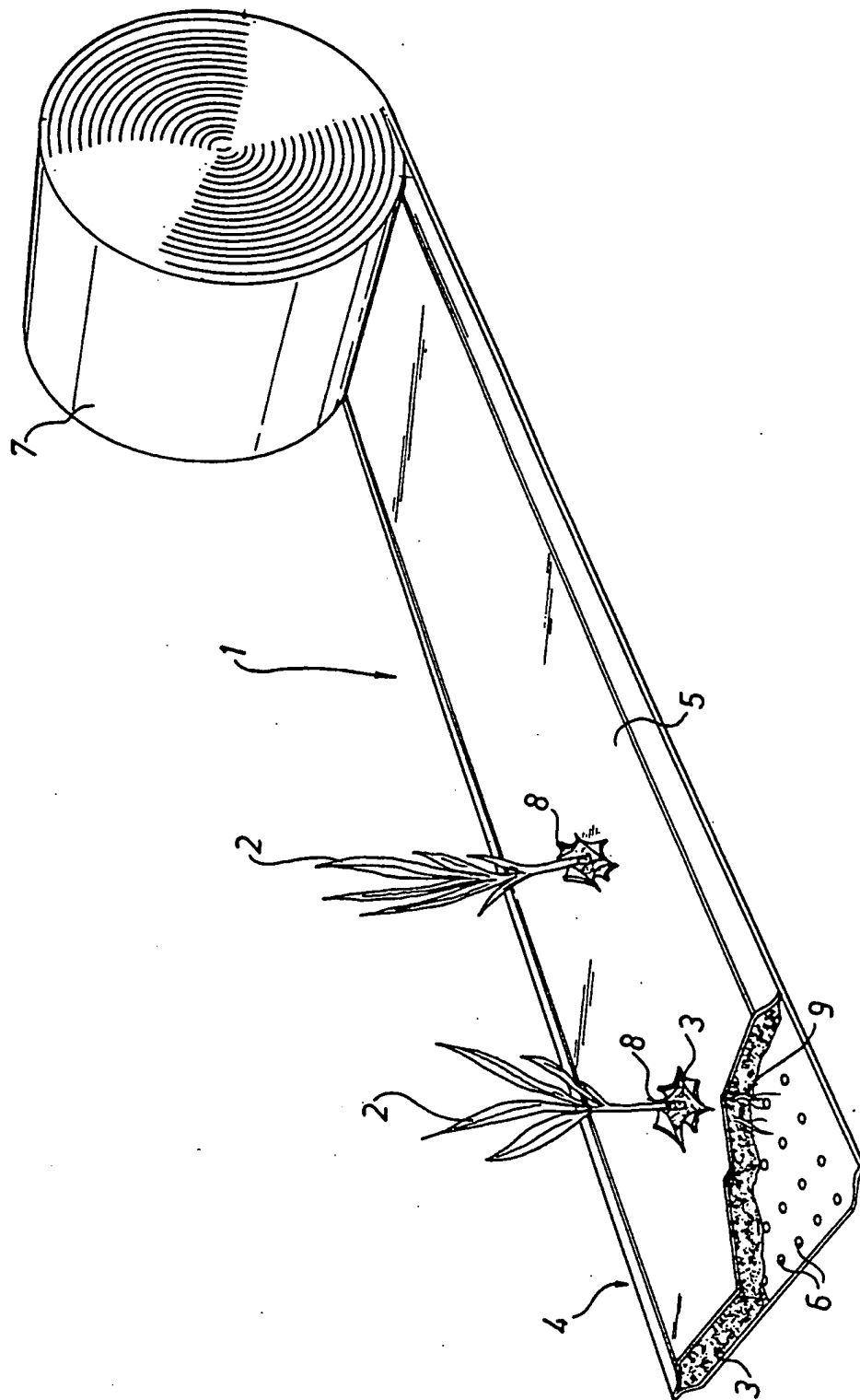
4. A substrate as claimed in claim 2 or 3,  
15 characterized in that the wrapping (4) is made from recyclable synthetic resin or from wet-strength paper.

5. A substrate as claimed in claim 2 - 4, characterized in that the upper face (5) of  
20 the wrapping (4) may be cut for insertion into the cuts (8) of plants (2), allowing the plant root system (9) satisfactory contact with the fibrous pulp material (3), and in that the lower face (6) of the wrapping (4) is perforated for drainage purposes.

25 6. A substrate as claimed in any one of the preceding claims, characterized in that the fibrous pulp material essentially consists of fluff (3).

7. A substrate as claimed in claim 6, characterized in that the fluff (3) is not refined and  
30 in that such substances as nitro-ammonium compounds, sodium and sulphur, essentially have been removed therefrom.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/00275

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC5: A01G 9/10 // A01G 31/00 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC5: A01G		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (names of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SE, B, 349225 (AMERICAN CAN COMPANY), 25 Sept 1972 (25.09.72), claim 1 --	1
X	EP, A1, 0147349 (SOCIETE FERTIL'AQUITAINE (SOCIETE ANONYME) ET AL), 3 July 1985 (03.07.85), claim 1 --	1
X	WO, A1, 8503192 (HEINSTEDT, DAVID), 1 August 1985 (01.08.85), figure 2, claims 1,3	1,2,4
Y	--	3,5
X	WO, A1, 8102968 (METZELER A/S), 29 October 1981 (29.10.81), abstract --	1,6,7
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
29 June 1994		14 -07- 1994
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4972627 (KAZUO HORI ET AL), 27 November 1990 (27.11.90), column 1, line 65 - line 67, figure 1	1
Y	-- -----	3,5

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

28/05/94

International application No.

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